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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,053	09/26/2003	Rainer Bruchhaus	14580-031001	1239

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EXAMINER

KIM, SU C

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 12/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/673,053

Applicant(s)

BRUCHHAUS ET AL.

Examiner

Su C. Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

REMARK / ARGUMENT

1. By the response of Office Action dated on 6/22/2005, Specification is amended, claims 2, 11, & 12 has been cancelled.
2. By the response of telephonic interview on 12/09/2005, with the applicant's representative to resolve claim objection issue in timely manner (See claim objection & 35 U.S.C 112 rejection below), the agreement has not been reached.

Response to Amendment

3. Applicant's amendment was received on 09/22/2005, and has been entered and made of record. Currently, claims 1, 3-10 are pending.

Specification

4. The corrected or substitute specification was received on 9/22/2005. The specification is acceptable.

DETAILED ACTION

Claim Objections

5. Claim 1 is objected to because of the following informalities: "... to cover the ferroelectric layer; etching the ferroelectric : layer" (lines 8-11). The Examiner took a position to understand claim language, however, claim language is not understandable to follow

typographical error between "ferroelectric : layer". Corrected to be as ferroelectric layer.

"promoting crystallisation" (line 16) has to be corrected as crystallization.

"whereby the crystallization" (line 20) has to be corrected as crystallization.

Appropriate correction is required.

6. Claim 4 is objected to because of the following informalities: "and oxidising".
typographical error. To be corrected as oxidizing.

Appropriate correction is required.

7. Claim 5 is objected to because of the following informalities: "is oxidised" has
typographical error. To be corrected as oxidized.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

Claims 1,6,9, &10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Regarding claims 1,6,9, &10 are described as “depositing a layer of amorphous ferroelectric material directly on a layer of a first electrically insulating material; depositing a layer of a second electrically insulating material to cover the ferroelectric layer; etching the ferroelectric layer to form isolated ferroelectric elements which have exposed side surfaces; providing a layer of conductive material in contact with each of the side surface” (lines 5-14).

9. Depositing a layer of a second insulating material to cover the ferroelectric layer and etching ferroelectric layer cannot be performed as described as claimed in independent claim 1 (lines 8-10). In independent claim 1, The Examiner can't think of any way to etching only ferroelectric material since a layer of second insulating material exists on the top of ferroelectric material because a layer of the second insulating mater will block etching chemicals to penetrate. Only way to etching ferroelectric material is to perform etching process before depositing the second insulating material. However, metal conductive material cannot be in contact with the side of ferroelectric material because of the second insulating material would be in contact with the side of ferroelectric material.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

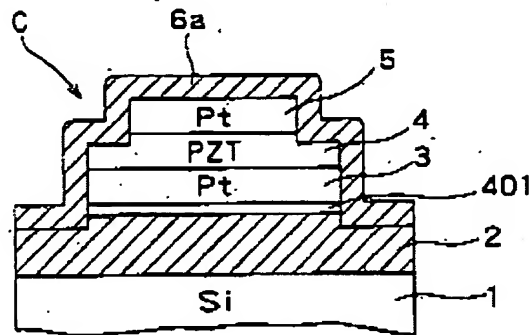


FIG. 18

Kanaya discloses a method of forming a ferroelectric capacitor comprising forming a crystalline PZT layer as claimed. **See all the FIGS** where Kanaya teaches the following limitations

Claims 1- 6 & 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Kanaya et al (USPUB 2004/0084701 A1).

10. Pertaining to claim 1, Kanaya discloses a method of forming a ferroelectric capacitor comprising forming a crystalline PZT layer by a process including the steps of:

depositing a layer of amorphous ferroelectric material 4 over a layer of a first material 3;

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etching the ferroelectric layer to form isolated ferroelectric elements (**See Fig 1 & 2, column 1 Paragraph [0018] ,please note briefly explain about etching process) ;**

providing a layer of a second material **5 & 6** on at least the side surfaces of the ferroelectric elements; and

performing an annealing step to crystallize the ferroelectric material (**Column 7 Paragraph [0129] Lines 4–7**);

the second material **5 & 6** promoting crystallization of the ferroelectric material to a higher degree than the first material **3**;

whereby the crystallization proceeds horizontally through the ferroelectric elements (**Please note thermal annealing process initiates to form a crystallization on ferroelectric material**) .

11. Pertaining to claim 3, Kanaya discloses a method according to claim 1 in which the second material is TiO₂ (**Column 7, Paragraph [0132], Please note Kanaya teaches insulation layer is “at least one of AlxOy, AlxSiyOz, TixOy, ZrxOy, MgxOy and MgxTiyOz is effective”**)

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12. Pertaining to claim 4, Kanaya discloses a method according to claim 3 in which the TiO₂ is formed by depositing Ti on at least the side surfaces of the ferroelectric elements, and oxidizing the Ti to form TiO₂ (column 7, paragraph [0132] & [0133], please note Kanaya teaches a method to form aluminum Oxide film and on paragraph [0132], Kanaya discloses TixOy can be used as replacement of aluminum oxide film (TiO₂:x=1, y=2)).

13. Pertaining to claim 5, Kanaya discloses a method according to claim 4 in which the Ti is oxidized to TiO₂ by chemical reaction with the ferroelectric material (Column 7, Paragraph [0129], Please note the purpose of thermal annealing is to crystallize ferroelectric material).

14. Pertaining to claim 6, Kanaya disclose a method according to claim 1 further including depositing electrode elements of conductive material 5 & 3 between the ferroelectric elements.

15. Pertaining to claim 8, Kanaya discloses a method according to claim 1 in which the ferroelectric material is PZT 4.

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Claims 6 & 10 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kanaya (USPUB 2004/0084701 A1).

16. Pertaining to claim 6, Kanaya disclose a ferroelectric device including a ferroelectric capacitor produced by a method according to claim 1.

17. Pertaining to claim 9, Kanaya discloses a ferroelectric capacitor produced by a method according to claim 1.

18. Pertaining to claim 10, Kanaya discloses a FeRAM memory device including a ferroelectric capacitor produced by a method according to claim 1

When the reference teaches a product that appears to be the same as, or an obvious variant of, the product set forth in a product-by-process claim although produced by a different process. See *In re Marosi*, 710 F.2d 799, 218 USPQ 289 (Fed. Cir. 1983) and *In re Thorpe*, 777 F.2d 695, 227 USPQ 964 (Fed. Cir. 1985). See also MPEP § 2113.

Conclusion

19. Because Claims 1,6,9, &10 are indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, The Examiner maintained Non-final rejection as final rejection.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Su C. Kim whose telephone number is (571) 272-5972. The examiner can normally be reached on Monday - Friday, 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Su C. Kim
12/11/2005



W. DAVID COLEMAN
PRIMARY EXAMINER